A Guide to Ridership Data

MassDOT/MBTA Office of Performance Management and Innovation (OPMI)

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How We Calculate Ridership

Ridership data comes from three main sources.

1

Automatic Passenger Counters (APC)

Primarily used for estimating **bus ridership**

2

Automated Fare Collection (AFC)

Primarily used for estimating **rapid transit and light rail ridership**, adjusted with factors to account for behind the gate transfers, and non-interaction (passengers who do not tap, e.g. children, fare evasion, etc.)

3

Manual counts

Primarily used for estimating **commuter rail ridership** and calibrating APC and AFC estimates

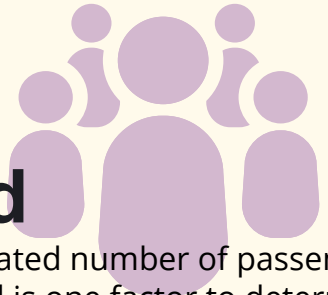
Key Words

Flow

The estimated number of passengers traveling through the rail system between stations.

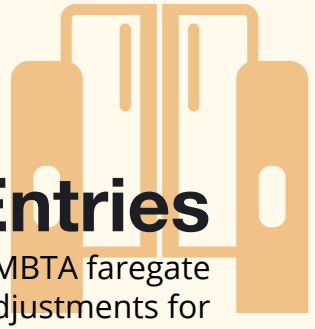
Ridership

For purposes of ridership reporting, we count “unlinked trips” – each passenger on each vehicle counts as one trip. This means that a rider who transfers from a bus to a rapid transit line on their journey counts as two unlinked trips. Similarly, a rider who transfers from Red Line to Orange Line for their journey also counts as two unlinked trips. When we report “ridership,” we try to ensure this includes the behind-the-gate estimates of ridership as well as non-interaction estimates. Read more in the “How We Calculate Ridership” section.



Load

The estimated number of passengers on the vehicle upon leaving a stop. Load is one factor to determine comfort. The load standards of each vehicle in the MBTA fleet are available in the Service Delivery Policy Appendix B: Vehicle Load. The MBTA currently lacks the data to accurately measure passenger loads on heavy and light rail vehicles, as well as on some of the bus and commuter rail fleets.



Station Entries

A “station entry” is defined as a validation at an MBTA faregate at a station with faregates. These do not include adjustments for people who enter the station without interacting with the gate.

Key Words

Service Day

An MBTA service date is defined as 3:00 am – 2:59 am (2:59 am the next day).

Peak Hour

According to the MBTA Service Delivery Policy, there are two distinct intervals for “rush hour” on weekdays. Morning rush hour, or AM_PEAK, is from 7:00 am to 8:59 am, and evening rush hour, or PM_PEAK, is from 4:00 pm to 6:29 pm. Saturday and Sunday do not have peak intervals.

Time Period

According to the MBTA Service Delivery Policy, there are nine time periods for service on weekdays, shown in the table to the right. Saturdays and Sundays are measured separately for most standards.

Time Period	Times
Very Early Morning	3am-5:59am
Early AM	6am-6:59am
AM Peak	7am-8:59am
Midday Base	9am-1:29pm
Midday School	1:30pm-3:59pm
PM Peak	4pm-6:29pm
Evening	6:30pm-9:59pm
Late Evening	10pm-11:59pm
Night	12am-2:59am

Season

Most of our ridership files contain averages from our fall rating. Ratings are the four times a year that the MBTA makes major schedule changes, but are not necessarily the same as the calendar seasons. Fall is generally September through December.

Suggested Use Cases

Use Case	File Name	Modes	Ridership Type	Rows	Years	Aggregation	Data Source
Find ridership by mode and line for a particular month Ex. *How many trips were taken on the Red Line in January 2019?*	Monthly Ridership by Mode	Rail, Silver Line, Bus, Commuter Rail, Ferry, The RIDE	Passenger trips	500	2016-2019	MM/YY, mode, route	APC, AFC, Manual counts
Find station entry volumes for an average weekday Ex. *How many people tap in at South Station on a typical weekday?*	Average Weekday Gated Entries	Rapid Transit	Validated taps at gates	63	FY 2019	Fiscal year, Stop	AFC
Find total ridership within a time interval, averaged to represent a typical service day Ex. *How many passengers board at South Station during morning rush hour?*	Rapid Transit by Time Period	Rail	Boardings and flow	5K	2017-2019	Time period, day type, route, stop	AFC
Find total ridership within a time interval, averaged to represent a typical scheduled vehicle trip Ex. *How many passengers board a 7 bus at South Station during morning rush hour?*	Bus by Time Period	Bus	Vehicle boardings and loads	400K	2016-2019, 2012 & 2018	Time period, day type, route, stop	APC

Suggested Use Cases

Use Case	File Name	Modes	Ridership Type	Rows	Years	Aggregation	Data Source
Find ridership for a single trip or a group of typical trips Ex. *How many passengers board at South Station for the 6:10 am trip on the Worcester Line?*	Commuter Rail by Trip	Commuter Rail	Vehicle boardings and loads	4K	2012, 2018	Vehicle trips, day type, route, stop	Manual counts
Find ridership for a single trip or a group of typical trips Ex. *How many passengers board at Hingham compared to Hull for the 5:40 am FH2 trip into Boston?*	Ferry by Trip	Ferry	Vehicle boardings and loads	70K	2018-2020	Vehicle trips, DD/MM/YY, route, stop, direction	Manual counts
Find ridership for a single trip or a group of typical trips Ex. *How many passengers board buses at South Station between 6:00 and 6:30 am?*	Bus by Trip	Bus	Vehicle boardings and loads	2.5 mil	2016-2019	Vehicle trips, day type, route, stop	APC
Find station entries within a time interval, averaged to represent a typical trip Ex. *How many people tapped into South Station on July 25th between 9:00 and 10:00 am?*	Gated Station Entries	Rail, Silver Line	Validated taps at gates	7.5 mil	2013-2020	DD/MM/YY, interval time period, route, stop	AFC

Average Weekday Gated Station Entries, FY19

Gated Station Name	Average Daily Station Entries*
South Station†	24,639
Downtown Crossing	24,074
Harvard	18,528
Kendall/MIT	17,018
Park Street	16,571
North Station†	16,273
Back Bay†	15,646
Central	15,405
State Street	12,928
Forest Hills†	12,538
Copley	12,244
Malden Center†	11,623
Alewife	11,514
Davis	11,442
Maverick	11,193
Haymarket	10,597

**These numbers are not adjusted for non-interaction or times when gates were not functioning.*
†Gated Station Entries only include passengers who enter the subway and Silver Line. Commuter Rail estimates are not included in this list.

Average Weekday Gated Station Entries, FY19

Gated Station Name	Average Daily Station Entries*
Charles/MGH	10,515
Ruggles†	9,199
Ashmont	8,841
North Quincy	8,428
Sullivan Square	8,305
Porter†	8,094
JFK/UMass†	8,012
Government Center	7,677
Kenmore	7,655
Airport	7,404
Wellington	7,174
Quincy Center†	7,120
Hynes Convention Center	7,041
Wonderland	6,866
Arlington	6,813
Oak Grove	6,637

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†Gated Station Entries only include passengers who enter the subway and Silver Line. Commuter Rail estimates are not included in this list.

Average Weekday Gated Station Entries, FY19

Gated Station Name	Average Daily Station Entries*
Broadway	6,020
Tufts Medical Center	5,976
Chinatown	5,747
Andrew	5,721
Lechmere	5,697
Massachusetts Avenue	5,627
Jackson Square	5,284
Boylston	5,265
Aquarium	5,130
Fields Corner	4,948
Quincy Adams	4,665
Roxbury Crossing	4,501
Braintree†	4,473
Orient Heights	4,300
Community College	4,159
Assembly	3,977

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†Gated Station Entries only include passengers who enter the subway and Silver Line. Commuter Rail estimates are not included in this list.

Average Weekday Gated Station Entries, FY19

Gated Station Name		Average Daily Station Entries*
Stony Brook	OL	3,501
Prudential	E	3,242
Beachmont	BL	3,139
Revere Beach	BL	3,098
Green Street	OL	3,055
Courthouse	SL	2,530
Shawmut	RL	2,286
Savin Hill	RL	2,199
Bowdoin	BL	2,127
Wood Island	BL	2,102
Riverside	D	1,855
Symphony	E	1,646
World Trade Center	SL	1,571
Science Park	E	873
Suffolk Downs	BL	521

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†Gated Station Entries only include passengers who enter the subway and Silver Line. Commuter Rail estimates are not included in this list.